



Pharmacy Technology Program 165.A0

Pharmacy Calculations

A. General Information

Program Name:	Pharmacy Technology	Competency:	02BM (elements 1, 2, & 3 only)
Course Title:	Pharmacy Calculations	Prerequisite:	None
Course Number:	202-1P1-AB Sect 1 & 2	Semester:	Fall 2022
Ponderation:	3-2-2	Instructor:	
Credits:	2.33	Office:	
Lecture:		Contact:	
Classroom:		Email:	
Laboratory:			
Laboratory Room:		Office Hours:	

- **Attendance:** *Due to the ongoing pandemic health issues, attendance policies may need to be adjusted by your teacher. The normal attendance expectations are outlined below and your teacher will inform you of any modifications as needed. Please note that attendance continues to be extremely important for your learning, but your teacher may need to define it in different terms based on the way your course is delivered during the semester.*
- **Please note that course outlines may be modified if health authorities change the access allowed on-site. This includes the possibility of changing between in-person and online formats.**

B. Introduction

This course is designed for health care professionals responsible for the preparation of drug prescriptions with the correct doses and dosages. It is part of the first semester of the Pharmacy Technology program. Skills learned in this class will be necessary for subsequent courses in the program and essential to daily tasks as a pharmacy technician.

Mathematical data processing related to pharmaceutical activities will be introduced. Measurements and usage of the appropriate laboratory equipment will be learned in the laboratory setting. The student will learn to prepare solutions accurately and precisely.

C. Course Objectives

Statement of the Competency:

Process mathematical data related to pharmaceutical activities (02BM).

Elements of the Competency:

1. Establish conversions between measurement systems.
2. Perform pharmaceutical drug calculations.
3. Develop mathematical conversion tools for the technical staff.

D. Evaluation Plan

Assessment	Ponderation*	Date **	Elements of the Competency
Unit Test I	10%	~Week 6	1
Unit Test II	15%	~Week 12	1, 2
Final Exam	25%	TBA	1, 2
Laboratories	35%	Weekly	1, 2, 3
Quizzes and/or assignments	15%	~Weekly	1, 2, 3

*Base ponderation. Subject to modification under the conditions listed below.

** See schedule for exact dates.

Please Note:

- To pass the laboratory portion of the course, a minimum of 60% of the total laboratory grade must be obtained. Failing this, a laboratory grade of **zero** will be given and a maximum grade of 55% will be allowed for the course.
- Notwithstanding other class grades, if a student passes the laboratory portion of the course, a grade of 60% or more on the final exam will guarantee a pass in the course.
- The final evaluation for this course is comprised of the Final Exam (25%) and the Laboratories (35%).

E. Course Content

Elements of the Competency:	Specific Performance Criteria: The student is expected to be able to...
1. Establish conversions between measurement systems.	1.1. Write values in the correct format. 1.1.1. Determine the appropriate number of significant figures. 1.1.2. Round to the correct number of digits. 1.1.3. Convert values to scientific notation. 1.1.4. Differentiate accuracy and precision. 1.2. Use the metric, apothecary, and household systems appropriately. 1.2.1. Identify and assign abbreviations and symbols. 1.2.2. Use equivalencies within a measurement system (<i>e.g.</i> 1000 mg in 1 g). 1.2.3. Convert values within a measurement system (<i>e.g.</i> 1 mg = 0.001 g). 1.3. Perform conversions of clinical measurements, time, and temperatures. 1.3.1. Use dimensional analysis and ratio proportions. 1.3.2. Add, subtract, multiply, and divide whole numbers, fractions, decimals, and percentages. 1.3.3. Interconvert fractions, decimals, and percentages. 1.3.4. Solve for an unknown. 1.3.5. Convert values between the metric, apothecary, and household systems (<i>e.g.</i> temperature in Fahrenheit to Celsius).

<p>2. Perform pharmaceutical drug calculations.</p>	<p>2.1. Calculate dosages</p> <p>2.1.1. Calculate oral solid doses. 2.1.2. Calculate oral liquid doses. 2.1.3. Calculate parenteral doses. 2.1.4. Calculate anticoagulants and insulin doses. 2.1.5. Calculate medications by age, body weight, and body surface area. 2.1.6. Calculate ratio and percent strength.</p> <p>2.2. Prepare a solution with accurate concentration.</p> <p>2.2.1. Define solute, solvent, and solution. 2.2.2. Define homogeneous and heterogeneous mixtures. 2.2.1. Perform a simple dilution and calculate the concentration of the dilute solution. 2.2.2. Perform serial dilutions and calculate the concentration of each solution.</p> <p>2.3. Calculate intravenous flow rates.</p> <p>2.3.1. Express rate. 2.3.2. Calculate intravenous infusion rates and amount of medication administered. 2.3.3. Calculate flow rates in drops per minute. 2.3.4. Calculate time needed to infuse a volume.</p> <p>2.4. Prepare a compound.</p> <p>2.4.1. Describe compounding formulations. 2.4.2. Scale up or scale down compounding preparations.</p>
<p>3. Develop mathematical conversion tools for the technical staff.</p>	<p>3.1. Use dimensional analysis efficiently for every calculation.</p> <p>3.1.1. Use appropriate units to perform calculations.</p> <p>3.2. Estimate an acceptable range for a value before performing a calculation.</p> <p>3.2.1. Use knowledge of the drug to estimate the expected value. 3.2.2. Use mental math to estimate a value.</p> <p>3.3. Develop rigorous data recording and coherence in problem solving methods.</p> <p>3.4. Use a conversion chart.</p>

F. Required Text; Course Costs in Addition to Texts

Beale, E. *Math Calculations for Pharmacy Technicians*, 4th Edition; Elsevier, 2022. (~\$85, part of your Pharmacy Technology textbook bundle)

Laboratory Requirements:

- * *Safety glasses must be worn at all times.* Good quality safety glasses are available from the bookstore (~ \$11 at the JAC Bookstore) or from most hardware stores. Normal prescription glasses may be worn.
- * A sturdy cotton lab coat (~ \$25 at the JAC Bookstore).
- * An instructor may require the student to purchase additional materials, such as a laboratory notebook or course notes.

G. Bibliography

None

H. Teaching Methods

The course will be 75 hours, divided into Lecture and Laboratory periods, as follows:

Lectures: 45 hours

Two 1.5-hour sessions per week consisting of the introduction of new material accompanied by the working of sample problems. In addition, preparation for upcoming laboratory sessions will be discussed during lecture time.

Laboratory Sessions: 30 hours.

There will be one 2-hour laboratory session per week.

I. Departmental Policies

a) Attendance policy: (*Policy 6*)

Students are expected to attend all lecture and laboratory sessions. Students are responsible for all assigned work, lecture material and other course related material announced or assigned during class. Attendance for laboratory periods is mandatory. Missing a lab period without a valid reason will result in a grade of zero being assigned to any work assigned during that period.

b) Policy relating to late submission: (*Policy 7*)

All assigned work is to be submitted on time. Late submission may be accepted, with or without penalty, at the discretion of individual instructors. (Discuss a request for an extension in advance of due dates.)

c) Policy dealing with the use of cell phones, laptops and other electronic devices: (*Policy 13*)

Use of personal electronic devices is permitted in the classroom or laboratory with teacher's permission.

Please Note:

- 1.** If you miss an evaluation session or deadline due to illness or other valid reason, you must notify your instructor as soon as possible. A valid medical note may be required to prove absence for a medical reason.
- 2.** A special note concerning the use of chemicals: this course uses chemicals as part of its normal teaching practices. If a student has experienced allergic reactions in the past due to any particular chemical or chemicals, he or she must inform the instructor. In the event that an allergic reaction is experienced at the college, the student should report to Campus Security immediately (local 6911, or 9-514-457-6911).
- 3.** Students are expected to behave respectfully towards their classmates and teachers. In case of inappropriate behaviour a student will be asked to leave the class or the lab session. If an assessment is planned for this session, a mark of zero will be given in that case.

J. College Policies

Policy No. 7- IPESA, Institutional Policy on the Evaluation of Student Achievement

<http://departments.johnabbott.qc.ca/wp-content/uploads/2017/08/Policy-7-IPESA.pdf>

a) Changes to Evaluation Plan in Course Outline (Article 5.3).

Changes require documented unanimous consent from regularly attending students and approval by the department and the Program Dean.

b) Religious Holidays (Articles 3.2.13 and 4.1.6)

Students who wish to miss classes in order to observe religious holidays must inform their teacher of their intent in writing within the first two weeks of the semester.

c) Student Rights and Responsibilities (Article 3.2.18 and Article 3.3.6)

It is the responsibility of students to keep all assessed material returned to them and/or all digital work submitted to the teacher in the event of a grade review. (The deadline for a Grade Review is 4 weeks after the start of the next regular semester.)

Students have the right to receive graded evaluations, for regular day division courses, within two weeks after the due date or exam/test date, except in extenuating circumstances. A maximum of three (3) weeks may apply in certain circumstances (e.g. major essays) if approved by the department and stated on the course outline. For evaluations at the end of the semester/course, the results must be given to the student by the grade submission deadline (see current Academic Calendar). For intensive courses (i.e., intersession, abridged courses) and AEC courses, timely feedback must be adjusted accordingly.

d) Cheating and Plagiarism (Article 9)

Cheating and plagiarism are unacceptable at John Abbott College. They represent infractions against academic integrity. Students are expected to conduct themselves accordingly and must be responsible for all of their actions.

College Definition of Cheating:

Cheating means any dishonest or deceptive practice relative to examinations, tests, quizzes, lab assignments, research papers or other forms of evaluation tasks. Cheating includes, but is not restricted to, making use of or being in possession of unauthorized material or devices and/or obtaining or providing unauthorized assistance in writing examinations, papers or any other evaluation task and submitting the same work in more than one course without the teacher's permission. It is incumbent upon the department through the teacher to ensure students are forewarned about unauthorized material, devices or practices that are not permitted

College Definition of Plagiarism:

Plagiarism is a form of cheating. It includes copying or paraphrasing (expressing the ideas of someone else in one's own words), of another person's work or the use of another person's work or ideas without acknowledgement of its source. Plagiarism can be from any source including books, magazines, electronic or photographic media or another student's paper or work.

- For PowerPoint on cheating and plagiarism, refer to the JAC Portal: My JAC Communities / Academic Council / Curriculum Validation Committee (CVC) / Course Outlines – Reference Documents / Academic Integrity.
- For link to interactive tutorial on how to cite sources correctly: <http://citeit.ccdmd.qc.ca>